International Scientific Conference

ABSTRACT BOOK

7-10 July 2015 • Paris, France

This Abstract book is based on a compilation of all abstracts selected for oral and poster presentations, as of 15 May 2015.

Due to the inability of some authors to attend, some of those works will therefore not be presented during the conference.

OUR UNDER
COMMON CLIMATE
FUTURE CHANGE

Welcome to the Conference

Welcome to Paris, welcome to 'Our Common Future under Climate Change'!

On behalf of the High Level Board, the Organizing Committee and the Scientific Committee, it is our pleasure to welcome you to Paris to the largest forum for the scientific community to come together ahead of COP21, hosted by France in December 2015 ("Paris Climat 2015").

Building on the results of the IPCC 5th Assessment Report (AR5), this four-day conference will address key issues concerning climate change in the broader context of global change. It will offer an opportunity to discuss solutions for both mitigation and adaptation issues. The Conference also aims to contribute to a science-society dialogue, notably thanks to specific sessions with stakeholders during the event and through nearly 80 accredited side events taking place all around the world from June 1st to July 15th.

When putting together this event over the past months, we were greatly encouraged by the huge interest from the global scientific community, with more than 400 parallel sessions and 2200 abstracts submitted, eventually leading to the organization of 140 parallel sessions.

Strong support was also received from many public French, European and international institutions and organizations, allowing us to invite many keynote speakers and fund the participation of more than 120 young researchers from developing countries. Let us warmly thank all those who made this possible.

The International Scientific Committee deserves warm thanks for designing plenary and large parallel sessions as well as supervising the call for contributions and the call for sessions, as well as the merging process of more than 400 parallel sessions into 140 parallel sessions. The Organizing Committee did its best to ensure that the overall organization for the conference was relevant to the objectives and scope. The High Level Board raised the funds, engaged the scientific community to contribute and accredited side events. The Conference Secretariat worked hard to make this event happening. The Communication Advisory Board was instrumental in launching and framing our communication activities on different media. We are very grateful to all.

We very much hope that you will enjoy your stay in Paris and benefit from exciting scientific

interactions, contributing to the future scientific agenda. We also hope that the conference will facilitate, encourage and develop connections between scientists and stakeholders, allowing to draw new avenues in the research agenda engaging the scientific community to elaborate, asses and monitor solutions to tackle climate change together with other major global challenges, including sustainable development goals.

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Semi-arid regions, such as the African Sahel, are typically located in the boundary between extremely dry (e.g. arid) and much wetter (e.g. humid subtropical) climate zones. The semi-arid regions of Africa and South Asia are subject to high year-to-year rainfall variability and people living in these regions are particularly exposed to the impacts of climate variability and climate change; the success of the seasonal rains can be critical to people's survival and their livelihoods. As the Earth warms, trends towards harsher or more productive climatic conditions will therefore have significant consequences for how people in semi-arid regions live with the environment and sustain their livelihoods.

The Adaptation at Scale in Semi-Arid Regions (ASSAR) project is one of four projects being funded through the Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA). We will present the latest evidence and understanding of climate-related variability and trends, in the semi-arid regions of Africa and South Asia, gathered by scientists working in the Climate and Biophysical Impact (CBI) team of ASSAR. In general, the weight of evidence suggests that climate change is having largely adverse effects on natural systems supporting people's livelihoods in semi-arid regions of Africa and South Asia. Temperatures in these regions are rising at above global average rates and in some locations this is leading to measurable impacts on human and natural systems. However, significant year-to-year and longer-term variability in rainfall patterns means that any attribution of rainfall trends to global climate change is complicated. Also, future projections show large disagreements in the direction of rainfall changes and climate models are subject to large uncertainties that complicate any interpretation of climate messages. Ultimately the impacts of climate change on human and biophysical systems will manifest themselves through the combined effect of changes in temperature, rainfall, humidity and other climate-related variables. Moreover, it is only by understanding specific system sensitivities and adaptive capacities that useful information can be derived to support adaptation research and practice. Examples of how climate variability and change is impacting socio-ecological systems in semi-arid regions of Africa and south Asia will be provided.

The CBI team is made up of climate scientists, crop modellers, hydrologists, ecologists and social scientists. In the first year of the project the team developed a series of "Regional Climate Messages" documents that were produced for the four regions under investigation, namely Southern Africa, East Africa, West Africa and India. The documents provide information about historical and future climate aimed at informing policymakers, practitioners and researchers working in these regions - key results will be shared. In addition, the team is continuing to work alongside colleagues in the ASSAR project to provide tailored information that can directly feed into the adaptation-focused research. Ultimately the wider ASSAR project research aims to both generate transferable knowledge related to issues of adaptation across multiple scales of governance and to develop transformative scenarios that influence adaptation and development planning in the focus regions.

P-2222-12

Analysis of Desertification Process and Impact of Climate Change by using Satellite data in the Algerian Steppe

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The degradation of natural resources in arid and semi-arid areas was highlighted dramatically during this century due to population growth and transformation of land use systems. The Algerian steppe has undergone a regression over the past decade due to drought cycle, the extension of areas cultivated in marginal lands, population growth and overgrazing. These phenomena have led to different degradation processes, such as the destruction of vegetation, soil erosion, and deterioration of the physical environment. In this study, the work is mainly based on the criteria for classification and identification of physical parameters for spatial analysis and multi-sources to determine the vulnerability of major steppe formations and their impact on desertification. To do this, we used satellite images Alsat-1 (2009) (IRS 2009) and LANDSAT TM (2001). These cross-sectional data with exogenous information could reduce the impact of climate change in the semi arid ecological diversity of steppe formations. This longitudinal study based on the use of remote sensing data is to analyze the evolution of steppe ecosystems. The application, through specific processes, including the supervised classification was used to characterize the main steppe formations. An analysis of the vulnerability of plant communities was conducted to assign weights and identify areas most susceptible to desertification. Vegetation indices are used to characterize the forest and steppe formations to determine changes in land use.

This study will map the different components of the steppe, highlighting the magnitude of the degradation pathways, which affects the steppe environment, allowing an analysis of the process of desertification in the region.

P-2222-13

Crop supplemental irrigation experiences in Burkina Faso

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This study assesses the impact of supplemental irrigation from small man-made basins on cereal production in climate variability and change context marked by dry spells in the Sahelian zone of Burkina Faso. After two years, the experiments showed that this innovation in family farms increases maize yield and allows growing a second crop with the surplus of water available in the basin. At the end of the 2012-2013 campaign, the average maize yield was estimated 2.5t/ha on experimental plots (EP) and 1.7t/ha on control plots (CP). The average yield of the 2013-2014 campaign was evaluated as 3.3T/ha and 0.9t/ha for EP and CP respectively. Increase in yield is 0.8t/ha for the 2012-2013 campaign and 2.4t/ha during 2013-2014. It appears as well as the yield obtained on EP in 2012-2013 and 2013-2014 for bridging cereal need of 2 and 6 additional persons respectively in agricultural households compared to the CP. The review of the Net present value, internal rate of return and the Net benefits increase ratio show that the profitability to practice supplemental irrigation depends on the types of basins.

2223 - Modeling Our Agricultural Future

ORAL PRESENTATIONS

K-2223-01

The Agricultural Model Intercomparison and Improvement Project: Transdisciplinary and Multi-scale Agricultural Projections of Climate Change Impacts

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The Agricultural Model Intercomparison and Improvement Project (AgMIP) is a major international effort linking the climate, crop, and economic modeling communities with cutting-edge information technology to produce improved crop and economic models and the next generation of climate impact projections for the agricultural sector.